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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,528	01/12/2004	Yoji Yamamoto	82478-4500	1298

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SNELL & WILMER LLP (OC)
600 ANTON BOULEVARD
SUITE 1400
COSTA MESA, CA 92626

EXAMINER	
HINES, ANNE M	
ART UNIT	**PAPER NUMBER**
2879	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/755,528	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Anne M. Hines	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5,8,9,17-23 and 26* is/are allowed.

6)☒ Claim(s) *1,2,6,7,10,11,16,24 and 25* is/are rejected.

7)☒ Claim(s) *3,4 and 12-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 7, 2007 has been entered.

Claims 1-26 are pending in the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 24-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Tyson (US 3056900).

Regarding claim 24, Tyson discloses a cathode structure comprising a heater including a columnar electric insulating material body (Fig. 5, 35; Column 2, lines 49-64) and a heating wire that is embedded in the electric insulating material body (Figs. 4-5, 20; Column 2, lines 49-64) and a cathode unit disposed at a first end surface of the electric insulating material body including a metal cup (Figs. 2-3, 28 & 32; Column 2,

lines 33-42) and a pellet member supported in the metal cup, the pellet member containing an electron-emitting material (Fig. 2, 31; Column 2, line 40), wherein the heating wire leads out from a second end surface of the electric insulating material body (Figs. 2 & 4, 18 & 19; Column 2, lines 23-24) and the heating wire is coiled into an S shape when viewed perpendicular to an axis through the cathode structure (Fig. 4, 20; Column 2, lines 49-64).

Regarding claim 25, Tyson discloses a cathode structure comprising a heater including a columnar electric insulating material body (Fig. 5, 35; Column 2, lines 49-64) and a heating wire that is partially buried and in contact with the electric insulating material body wherein the heating wire is coiled into an S shape when viewed perpendicular to an axis through the cathode structure within the insulating material body around a first axis (Figs. 4-5, 20; Column 2, lines 49-64); and a cathode unit is disposed at a first end surface of the electric insulating material body including a metal cup (Figs. 2-3, 28 & 32; Column 2, lines 33-42) and a pellet member supported in the metal cup, the pellet member containing an electron emitting material (Fig. 2, 31; Column 2, line 40); wherein the heating wire leads out from a second end surface of the electric insulating material body (Figs. 2 & 4, 18 & 19; Column 2, lines 23-24) and the first axis of the coiled heating wire is parallel to the first end surface of the electric insulating material to provide a compact configuration for the cathode structure with an enlarged heat transmitting capacity (Figs. 4 & 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 6-7, 11, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griggs et al. (GB 2296371 A) (copy provided) in view of Stein (US 2899591).

Regarding claim 1, Griggs teaches a cathode structure comprising a heater including a columnar electric insulating material body (Fig. 1, 7; Page 3) and a heating wire that is partially buried and in contact with the electric insulating material body, wherein the heating wire is coiled, within the insulating material body, around a first axis (Fig. 1, 4; Page 3); and a cathode unit is disposed at a first end surface of the electric insulating material body including a cup (Fig. 1, 1; Page 3) and pellet member supported in the cup, the pellet member containing an electron-emitting material (Fig. 1, 3; Page 3), wherein the heating wire leads out from a second end surface of the electric insulating material body and the first axis of the coiled heating wire is parallel to the first end surface of the electric insulating material to provide a compact configuration for the cathode structure with an enlarge heat transmitting capacity (Fig. 1). Griggs is silent regarding the material of the cathode cup and, while the drawings appear to indicate that the insulating body has a diameter larger than a height, is silent regarding the proportion of the insulating body.

In the same field of endeavor of cathode heaters, Stein teaches wherein a cathode structure including heating wire with insulating coating has a greater diameter than height (Column 2, lines 11-22) and a metal cathode with electron emissive material thereon (Fig. 1, 12 & 14; Column 2, lines 14-17; Column 2, line 36) in order to more efficiently emit electrons and thereby reduce the size of power supply required to operate the cathode heater (Column 1, lines 46-50).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Griggs to have the cathode cup be metal and to have cathode and insulating body have a greater diameter than height in order to more efficiently emit electrons and thereby reduce the size of power supply required to operate the cathode heater, as disclosed by Stein.

Regarding claim 2, Griggs further discloses wherein the insulating material body includes a wall disposed on the second end surface so as to surround a position from which the heating wire leads out (Fig. 1, 8; Page 3).

Regarding claim 6, Griggs further discloses wherein the cathode heater of claim 1 is included in the structure of an electron gun (Abstract).

Regarding claim 7, Griggs further discloses wherein the electron gun and cathode heater of claim 6 is included in a cathode ray tube (Abstract).

Regarding claim 11, Griggs further discloses wherein the electric insulating material body is made of a ceramic (Page 1).

Regarding claim 16, Griggs further discloses wherein the columnar electric insulating material has a cylinder shape with a lower extending annular wall surrounding the exit of the heating wire from the second end surface (Fig. 1, Page 3).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Griggs et al. (GB 2296371 A) (copy provided) and Stein (US 2899591) in view of Lee (US 5451831) (of record).

Regarding claim 10, Griggs and Stein teach the invention of claim 1, but are silent regarding the composition of the electron-emitting material.

In the same field of endeavor of electron-emitting materials for cathodes of cathode ray tubes, Lee teaches a cathode with an electron-emitting material of barium oxide (Column 3, lines 21-46) in order to provide a cathode where the electron emission material is not rapidly exhausted due to operation of the cathode heater (Column 4, lines 11-27).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Griggs and Stein to have the electron emission material be barium oxide in order to provide a cathode where the electron emission material is not rapidly exhausted due to operation of the cathode heater, as disclosed by Lee.

Allowable Subject Matter

Claims 5, 8-9, 17-23, and 26 are allowed.

Claims 3-4 and 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding independent claim 5, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 5, and specifically comprising the limitation wherein a cathode structure comprises a columnar electric insulating material body having a diameter larger than a height and a heating wire partially buried and in contact with the electric insulating material body and leads out from a side surface thereof, wherein the heating wire is coiled within the insulating material body around a first axis transverse to the side surface and wherein the electric insulating material body includes a protrusion disposed on the side surface between a position from which the heating wire leads out and the surface of the cathode united from electrons are emitted.

Regarding claims 8-9 and 17-19, claims 8-9 and 17-19 are allowable for the reasons given in claim 5 because of their dependency status from claim 5.

Regarding independent claim 20, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 20, and specifically comprising the limitation wherein a cathode structure for an electron gun

comprises a metal cylindrical cup with a columnar pellet contained within an inner diameter of the metal cup and a columnar electric insulating material body having a diameter larger than a height including a heating wire in contact with insulating material of the insulating material body, having electrode leads extending from one end of the insulating material body around a first axis parallel to the electron emitting surface of the columnar pellet and a plurality of support wires attached to the cathode structure between a bottom of the metal cup and a surface of another end of the columnar electric insulating material body to extend laterally outward from the bottom of the metal cup and the columnar electric insulating material body having a lower extending annular wall surrounding the electrode leads.

Regarding claim 21, claim 21 is allowable for the reasons given in claim 20 because of its dependency status from claim 20.

Regarding independent claim 22, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 22, and specifically comprising the limitation wherein a cathode structure comprising a heater including a columnar electric insulating material body having a diameter larger than a height and a heating wire that is partially buried and in contact with the electric insulating material body and the heating wire leads out from a second end surface of the of the electric insulating material body, wherein the electric insulating body is in a circular columnar shape, has a longitudinal axis, and includes a part that has a greater

diameter than that of the second end surface and the heating wire is coiled within the insulating material body around a first axis that is transverse to the longitudinal axis.

Regarding independent claim 23, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 23, and specifically comprising the limitation wherein a cathode structure comprises a heater including a columnar electric insulating material body and a heating wire that is partially buried and in contact with the electric insulating material body and the heating wire leads out from a second end surface of the electric insulating material body and the electric insulating material body includes a wall disposed on the second end surface so as to surround a position from which the heating wire leads out and is disposed around a perimeter of the second end surface, the second end surface surround by the wall rises in a dome shape and the heating wire leads out from a position between the wall and a center of the second end surface.

Regarding independent claim 26, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 26, and specifically comprising the limitation wherein a cathode structure comprises a columnar electric insulating material body and a heating wire that is partially buried and in contact with the electric insulating material body, wherein the heating wire is coiled within the insulating material body around a first axis and the heating wire leads out from a second end surface of the electric insulating material body and the first axis of the coiled heating wire is parallel to the first end surface of the electric insulating material, the electric insulating body includes a wall disposed on the second end surface so as to

surround a position from which the heating wire leads out, wherein the wall is disposed around a perimeter of the second end surface, the second end surface surrounded by the wall rises in a dome shape and the heating wire leads out from a position between the wall and a center of the second end surface.

Regarding claim 3, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 3, and specifically comprising the limitation wherein the wall is disposed around a perimeter of the second end surface, the second end surface surrounded by the wall rises in a dome shape and the heating wire leads out from a position between the wall and a center of the second end surface.

Regarding claim 4, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 4, and specifically comprising the limitation wherein the electric insulating material body is in a circular columnar shape and includes a part that has a greater diameter than that of the second end surface.

Regarding claim 12, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 12, and specifically comprising the limitation wherein a supporting metal wire is attached to the cathode structure between the metal cup and the heater.

Claims 13 and 14 depend from claim 12 and are objected to as allowable for the same reasons as claim 12.

Regarding claim 15, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 15, and specifically comprising the limitation wherein the columnar electric insulating material body has a trapezoidal cross-sectional shape.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anne M Hines
Patent Examiner
Art Unit 2879

NIMESHKUMAR D. PATEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600